

A revision of *Peltiera*, a new, poorly known and probably extinct genus of Leguminosae (Papilionoideae-Aeschynomeneae) from Madagascar

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ABSTRACT

Peltiera, a new, poorly known and probably extinct genus of the tribe Aeschynomeneae (Leguminosae-Papilionoideae) is described. It includes two new species, both endemic to Madagascar (*P. alaotrensis* Du Puy & Labat and *P. nitida* Du Puy & Labat).

MOTS CLÉS

Leguminosae,
Papilionoideae,
Peltiera,
Madagascar.

RÉSUMÉ

Peltiera, un nouveau genre, peu connu et probablement éteint, de la tribu des Aeschynomeneae (Leguminosae-Papilionoideae) est décrit. Endémique de Madagascar, il est constitué de deux nouvelles espèces (*P. alaotrensis* Du Puy & Labat et *P. nitida* Du Puy & Labat).

Prior to the completion of an account of the subfamily Papilionoideae in Madagascar, three collections were located in the Paris herbarium (P) which appear to represent two new taxa in the tribe Aeschynomeneae (Benth.) Hutch. RUDD (1981) recognised 25 genera in this tribe, but LANVIN (1986, 1987) later transferred the genus *Diphysa* Jacq. from the Robineae to the Aeschynomeneae: along with the new genus described here, this brings the total number of genera in this tribe to 27, the subtribe Ormocarpaceae Rudd containing nine of these genera. The tribe is represented by nine genera in Madagascar, of which one, *Arachis* L., is only known in cultivation, and two of them, *Ormocarpopsis* R. Vig. and the new genus here named *Peltiera*, are endemic to the island. Of the 37 species in this tribe recorded from Madagascar, 15 are endemic and a further species is only known elsewhere from the Comoro Islands.

The three specimens are very incomplete, but through the combination of all the characters observable it has become evident that these two closely related taxa are allied to two other genera of the Aeschynomeneae, *Ormocarpum* P. Beauv. and *Ormocarpopsis* R. Vig. (with 2 and 6 species respectively in Madagascar, LABAT & DU PUY 1996). The characters directly observable in these three herbarium collections preclude the incorporation of these two taxa in the genera already known from Madagascar, and similarly in any of the other 24 genera of the tribe (RUDD 1981). The characteristics of these taxa make the description of a new genus necessary, here named *Peltiera*, although it is still incompletely known.

Field investigations in Madagascar have been unsuccessful in locating more recent and complete material of these evidently rare species in their recorded localities. These disjunct areas, east of Lac Alaotra and the Moramanga area towards the eastern escarpment of the Central Plateaux, and in the northern end of the Tampoketsa d'Ankazobe between the Ikopa and the Betsiboka Rivers in the western slopes of the Central Plateaux, are both very disturbed with only a few remnant forest patches still surviving. The Lac Alaotra region was well collected by many botanists and agronomists stationed at the Agricultural Experimental Station of Lac Alaotra.

Similarly, the Moramanga region is easily accessible and well collected by botanists. In both of these sites the two species were collected only once prior to 1944, but have not been recorded since. The Tampoketsa of Ankazobe is almost entirely deforested, and it is possible that a rare species like *P. nitida* could have disappeared since the single collection was made in 1924. For these reasons we suggest that this genus is in critical danger, and may even be already extinct in Madagascar. This could be the first example of a modern genus which is described after it has become extinct.

Peltiera is allied to the genera *Ormocarpum* and *Ormocarpopsis*. The flowers of all three genera closely resemble each other, although the bracteoles are situated lower down the pedicel in *Peltiera*. These genera, in common with many of the Aeschynomeneae, all have, their stamens fused into two flanges of five. The leaves of *Ormocarpopsis* and *Peltiera* have a characteristic discolouration of the undersurface of the leaflet or the midvein of the leaflet (which may only become apparent on drying); this is absent in *Ormocarpum*. However, the pod structure is characteristic for each of these genera: *Ormocarpum* has lomentaceous pods with several, 1-seeded segments, jointed between the segments, the segments flat or strongly compressed and indehiscent; *Ormocarpopsis* pods are neither segmented nor compressed, contain 1-4 seeds and are indehiscent; *Peltiera* has segmented pods as in *Ormocarpum*, but only one segment develops (as indicated by the presence of aborted segments in mature fruits), and this segment is swollen, resembling *Ormocarpopsis*. The description of the pod given by PERIER DE LA BATHIE, on the label of the type specimen of *P. nitida*, includes the phrase "Le fruit est ... plus ou moins charnu et, à la fin, déhiscent pour libérer la graine, qui est entourée d'un albumen ? assez épais blanc". The dried fruit do appear to split readily into 2 valves, but the fleshy white structure described as enclosing the seed (possibly a fleshy endocarp or aril) is not discernible in the dried material available. This description, if precise, is entirely different from either *Ormocarpum* or *Ormocarpopsis*. The surface texture of the pods is similar in

Ormocarpopsis and *Peltiera*, lacking strong longitudinal nerves, an unusual character in the subtribe *Ormocarpinae* (RUDD 1981).

This genus appears to be primitive in the tribe

Aeschynomeneae, in common with the other genera in the subtribe *Ormocarpinae* (RUDD 1981), and this new discovery could be important in studies of the phylogeny of the tribe. If

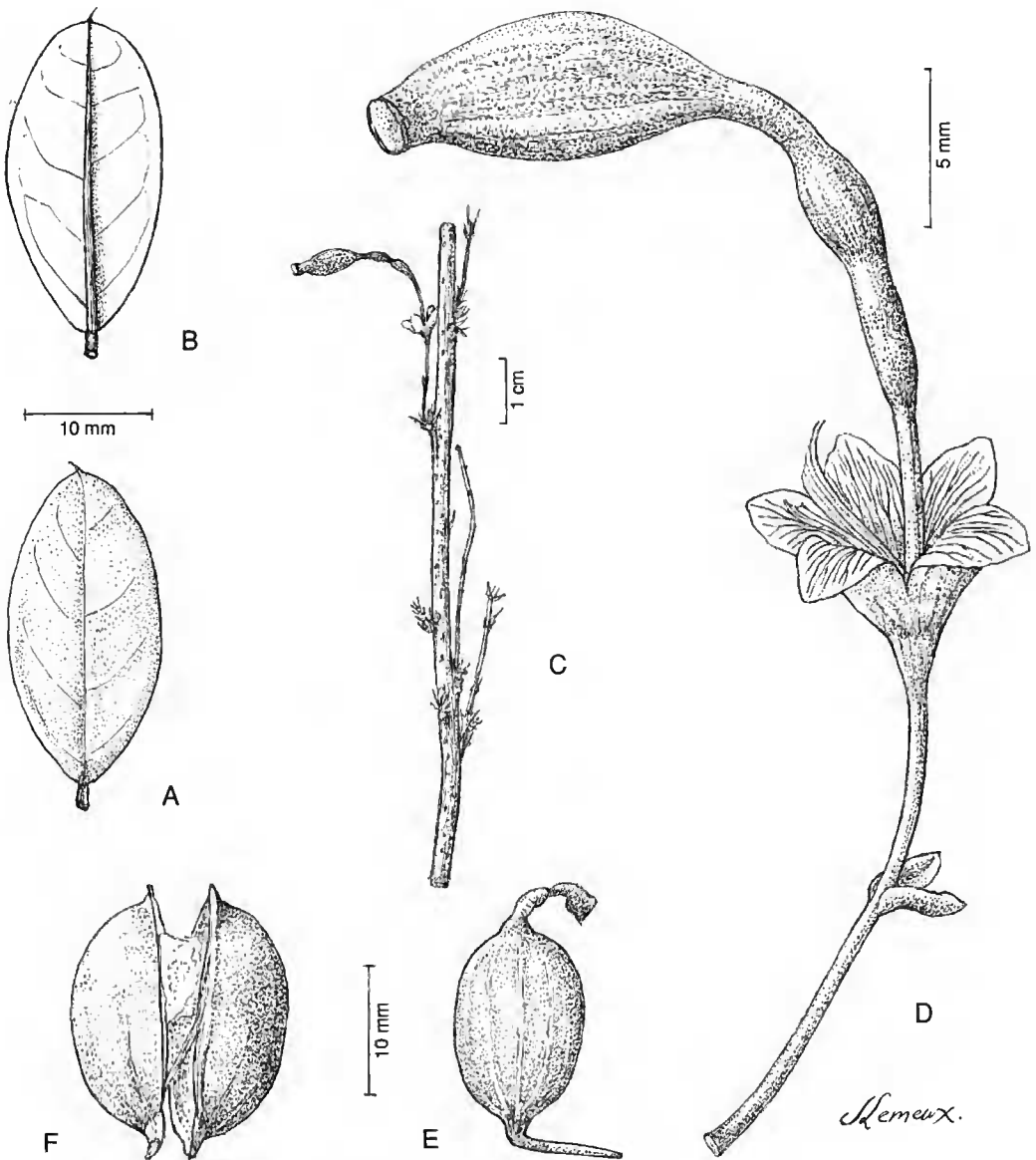


Fig. 1.—*Peltiera alaotrensis*: A, leaflet upper surface; B, leaflet lower surface; C, fruiting shoot; D, young fruit with calyx remnants; E, fruit; F, open segment of fruit. From Cours 1812.

future phylogenetic studies confirm the first results of CHAPPILLI (1995), the Ormocarpaceae represent a separate phylum from the other Aeschynomeneae, which is basal for the Psoraleaceae, Dalbergiaceae, Amorpheae and another 12 tribes or parts of tribes. Following this hypothesis, the discovery of the genus *Peltiera* could also provide important information for the phylogeny of the entire Papilionoidete. Madagascar has been shown to be a primary centre of diversification in other primitive papilionoid tribes, such as has been demonstrated in the tribe Indigofereae with the presence of the basal genera *Phyllaxylon* and *Vaughania* (see SCHRIERE 1995 and DU PUY et al. 1994, 1995). There appears to have been an ancient presence of this phylum in Madagascar, since perhaps as far back as the Cretaceous period, and the island is now a modern refugium for some ancient groups (LABAT 1996).

PELTIERA Du Puy & Labat, gen. nov.

Frutex; rami a brachyblastis instructi. Stipulae striatae. Folia impari-pinnata, alternifoliata, foliolorum costa subtus rubra. Flores solitarii vel in racemis brevibus congesti. Bracteolae pedicellorum infra medium insertae. Calyx subaequaliter 5-dentatus, basi ab hypanthio breviter terminatus. Vexillum erectum; alae inter venas ad basin plicatae; carina recalcitrata. Stamina in grege duos adnata. Ovarium stipitatum, lineare, glabrum vel a pilis glandulosis instructum, multiovulatum. Silus elongatus, tenuis, curvatus, glaber. Legumen stipitatum, articulatatum, articulo uno solum seminifero, aliis abortivis basi vel apice persistentibus. Articulatatum verticaliter compressum, in valvis duabus patens, uniseminatum. Semen ellipsoideale, verticaliter compressum, hilo medio, exiguo.

TYPUS.—*P. nitida* Du Puy & Labat.

Shrubs. Twigs with brachyblasts (short, contracted lateral shoots densely covered in overlapping stipules). Stipules triangular, striate, with several, parallel veins. Leaves pinnate with alternate leaflets. Leaflets with a reddish midvein beneath which becomes black to near the apex on drying. Flowers solitary or in short racemes, produced on the brachyblasts and in the axils of leaves on young shoots, yellow. Pedicels with a pair of bracteoles in the lower half. Calyx 5-toothed, not distinctly 2-lipped, the lower tooth

about as long as the others, with a short hypanthium. Standard petal erect with two basal protruberances; wings with crescent-shaped folds between the veins towards the base; keel without spurs. Stamens fused into 2 groups of 5; anthers medifixed, dehiscent through longitudinal slits. Ovary stipitate, linear, glabrous or with glandular hairs along the margins, with several ovules; style long, slender, curved, glabrous; stigma minutely capitate. Pod stipitate, segmented, but only a single segment developing, the aborted segments often persisting at the base or apex; segment vertically compressed, leathery or woody, splitting into 2 boat shaped valves, 1-seeded (the seed reported to be enclosed in a white, fleshy structure). Seed ellipsoidal, vertically compressed, with a small, central hilum.

A genus of two species endemic to Madagascar, occurring in central Madagascar and the higher altitude eastern escarpment forests.

This genus is dedicated to Maurice PELTIER, in recognition of his outstanding contributions to the knowledge of the Papilionoideae of Madagascar.

Key to the species of *Peltiera*

- Leaves with 7 or 8 leaflets; leaflets up to 22 × 11 mm, not glossy, glaucous beneath; ovary glabrous *P. alaotrensis*
- Leaves with (1-)2-4 leaflets; leaflets large, 33-55 × 20-30 mm, glossy; ovary with swollen-based glandular hairs along the margins *P. nitida*

***Peltiera alaotrensis* Du Puy & Labat, sp. nov.**

Frutex. Folium foliolis 7-8 ellipticis-obovatis circa 18-22 mm longis et 7-11 mm latis, glabris. Legumen glabrum eglandulosum.

TYPUS.—*Cours 1812*, E central Madagascar, Rivière Menaloha, 1450 m, 11 Dec. 1944, fr. (holo-, P; iso-, K, P, TAN).

A shrub ca. 4 m tall; twigs glabrous; flowering from brachyblasts covered in persistent stipules.

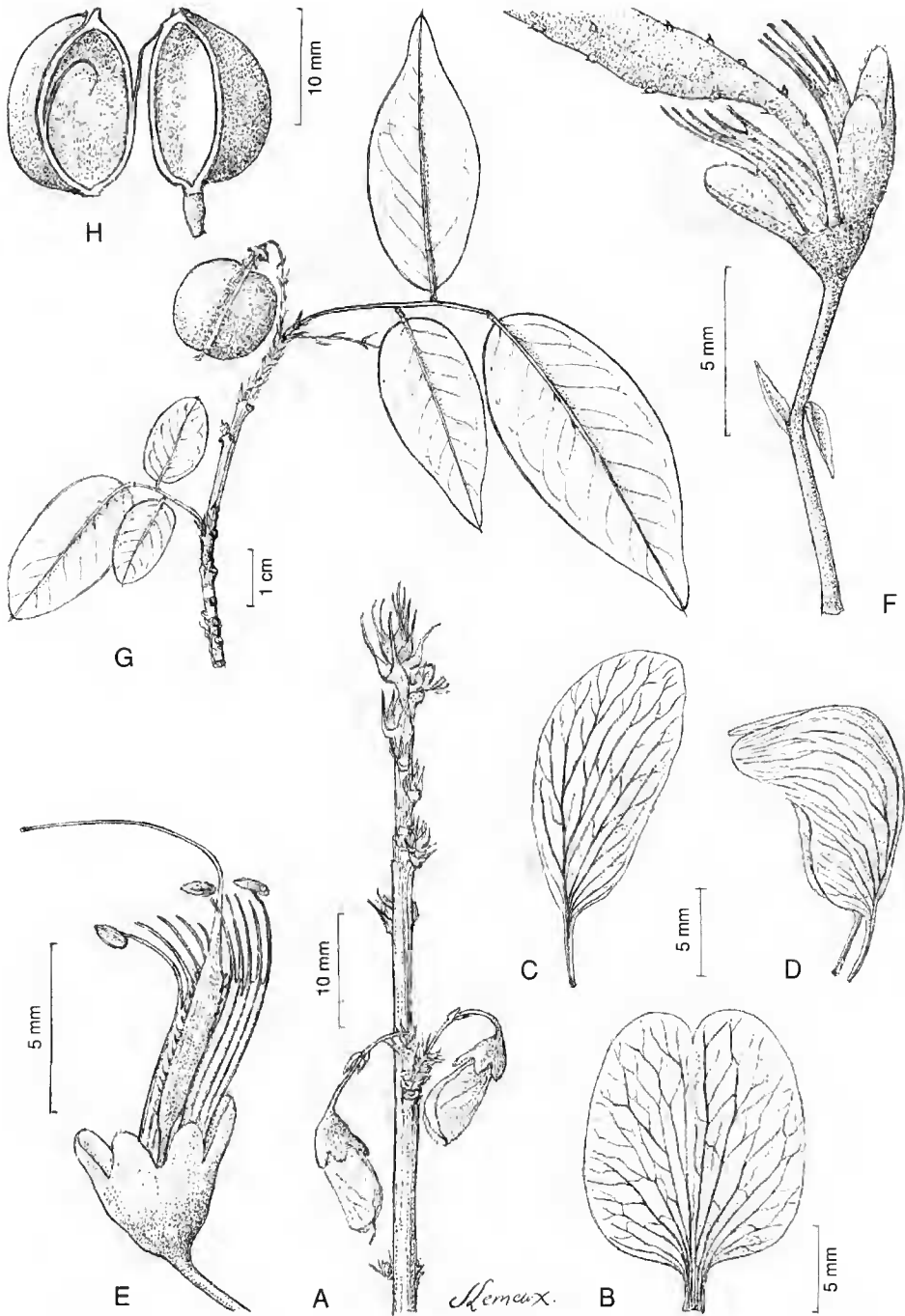


Fig. 2.—*Peltiera nitida*: A, flowering shoot; B, standard petal; C, wing petal; D, keel; E, calyx, androecium and gynoecium; F, calyx and young pod detail; G, fruiting shoot; H, open segment of fruit. A-E from Decary 7233; F-H from Perrier de la Bâthie 15898.

Stipules narrowly triangular, tapering, ca. 4 mm long, striate. Leaves with 7 or 8 alternate leaflets; rachis glabrous, somewhat zigzag, with a few minute tubercles. Leaflets elliptic to obovate, ca. 18-22 × 7-11 mm, base cuneate, apex obtuse and mucronulate, glabrous, glaucous beneath, not glossy, the central vein reddish beneath and drying black. [Flowers not known]. Pedicel (in fruit) 12-15 mm long, glabrous; bracteoles situated on the lower half of the pedicel, ovate, ca. 1.5 mm long. Calyx remnants ca. 5 mm long, glabrous; teeth obtuse, the lower tooth about as long as the others. Pod solitary, stipitate, segmented but only a single segment developing, the aborted segments persisting at the base or apex, glabrous and eglandular; fertile segment ellipsoidal, vertically compressed, 15-21 × 8-9 × 14-18 mm, splitting into 2 boat-shaped valves, containing a single large seed; seed ca. 12 × 9 mm.—Fig. 1.

DISTRIBUTION AND HABITAT.—E central Madagascar, only known from the type specimen collected east of Lake Alaotra, in somewhat seasonal evergreen forest, at 1450 m altitude.

FLOWERING TIME.—Not known (fruit present in December).

The habit and pods of this species are similar to *P. nitida*, but the leaves have more numerous leaflets, the leaflets are smaller, thinner in texture and not glossy, and there are no glands on the margins of the aborted segments of the pod.

***Peltiera nitida* Du Puy & Labat, sp. nov.**

A. P. alaotrensis Du Puy & Labat, *foliolis paucioribus majoribus nitentibusque differt.*

TYPUS.—*Perrier de la Bathie* 15898, W Madagascar, env. de Mahatsinjo, confins nord du Tampoketsa entre l'Ikopa et la Betsiboka, ca. 900 m, Jan. 1924, fr. (holo-, P; iso-, K, P).

A shrub 1-5 m tall, flowering along with mature leaves; twigs glabrous; flowers produced from brachyblasts covered in persistent stipules and from the axils of leaves on young shoots. Stipules

narrowly triangular, 6-9 mm long, with a long, tapering tip, striate. Leaves with (1-)2-4 alternate leaflets; rachis glabrous or with a few minute tubercles, terete, zigzag. Leaflets relatively large, elliptic to obovate, 33-55 × 20-30 mm, the base rounded, the apex acute to acuminate or cuspidate, mucronate, glabrous, glossy above and beneath, with the central vein prominent, thick and reddish beneath and drying black to near the apex. Flowers solitary or in short racemes up to 20 mm long, with up to 6 bracts but these mainly sterile; bracts narrowly triangular, ca. 4 mm long. Flowers ca. 12 mm long, yellow; pedicels 10-14 mm long, glabrous; bracteoles situated on the lower half of the pedicel (5-8 mm below the calyx), ovate, 1.5-2 mm long, with scarious margins, ciliate apically. Calyx ca. 6 mm long, glabrous except for a few marginal hairs, the hypanthium ca. 1.5 mm long; teeth subacute, the lower tooth about as long as the others. Standard subcircular, the limb ca. 10 × 10 mm, emarginate apically, with 2 callous protuberances at the base, the claw ca. 2 mm long. Wings asymmetrically obovate, the limb ca. 9 × 5 mm, rounded apically, oblique but not auriculate basally, the lower margin rounded, the surface with small, crescent shaped folds between the veins towards the base, with a claw ca. 2 mm long. Keel limb semicircular, ca. 9 × 4 mm, with a claw ca. 2 mm long. Ovary with a ca. 1.5 mm long stipe, linear, flat, ca. 4 mm long, with swollen-based glandular hairs along the margins, with 3 or 4 ovules; style slender, ca. 6 mm long; stigma minutely capitate. Pod stipitate, segmented when very young but only a single segment developing, the aborted segments persisting at the base or apex; fertile segment ellipsoidal, vertically compressed, 16-20 × 7-9 × 14-17 mm, splitting into 2 boat-shaped valves, containing a single large seed; seed ca. 12 × 8 mm (enclosed in a fleshy, white endocarp or aril?).—Fig. 2.

DISTRIBUTION AND HABITAT.—Central Madagascar, only known from two specimens, the type specimen from NW of Antananarivo, the other one from near Moramanga, in deciduous woodland remnants (W central) and margins of somewhat seasonal evergreen forest (E central), at ca. 900-1000 m altitude.

PARATYPE.—*Decary* 7233, E central Madagascar, Moramanga, 21 Feb. 1930, fl. (K, MO, P).

FLOWERING TIME.—February (but mature fruits also collected in January).

This species can be distinguished from all other species of *Peltiera*, *Ormocarpopsis* and *Ormocarpum* in Madagascar by its leaves with few, large, glossy leaflets.

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